

# AmbiMate SENSOR MODULE

## MS4 Series

TE Connectivity (TE)'s AmbiMate sensor module MS4 series provides an application specific set of sensors on a ready to attach PCB assembly for easy integration into a host product. Design resources are freed and time to market accelerated by integrating the MS4 series pre-engineered, four core sensor solution for Motion / Light / Temperature / Humidity into your next product.

Other MS4 series sensor modules include VOC (Volatile Organic Compound), eCO<sub>2</sub> (equivalent carbon dioxide ) and sound detection. Add the capability to monitor air quality through the capture of VOC concentrations. Select an MS4 series with a microphone to augment motion detection or to listen for sound events.

All MS4 series sensor modules offer the flexibility of sharing a common seven position connection. This allows the designer to layout a single PCB footprint accommodating all the available sensor configurations at production.



### Applications

- Indoor Lighting
- Building Automation
- Connected Home
- Air Quality
- Energy Management
- Work Space Comfort
- Zonal Environmental Controls

### Four Core Sense Capability

- Motion (PIR)
- Light
- Temperature
- Humidity

### Optional Sense Capability

- VOC
- eCO<sub>2</sub>
- Sound (microphone)

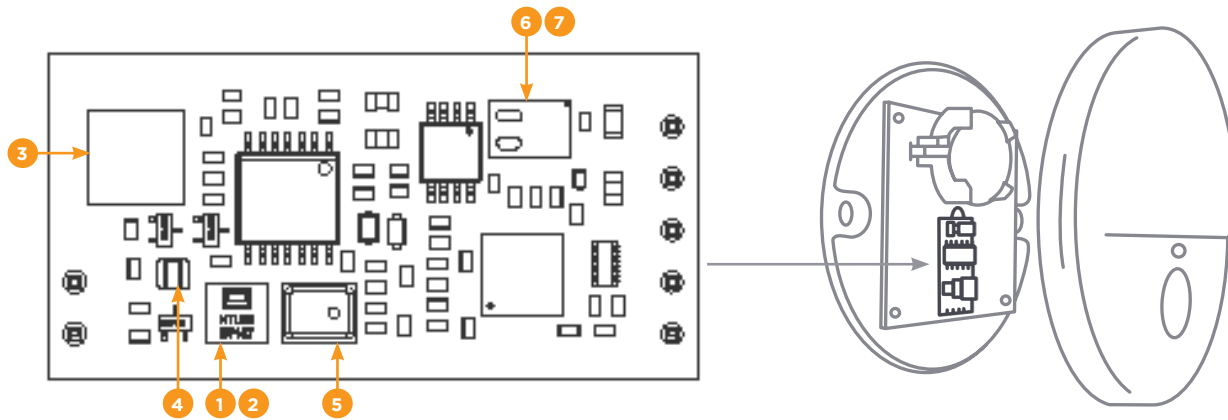
### Specifications

- Application Specification: [114-133092/114-133115](#)
- Design Objectives / Specification: [108-133092](#)

### Benefits

- Design resources are freed and time to market is accelerated
- Simplicity of popular I<sup>2</sup>C communication protocol
- Event out pin for real time motion detection
- Space saving compact design
- Multiple attach methods to accommodate your application need
- One footprint allows multiple sensor configurations & flexibility in design

## Product Specifications



Item	Sensor	Sensor Performance
1	Temperature	5°C to +50°C ± 1°C Accuracy, 1 second acquisition rate
2	Relative Humidity	5% to 95% RH, 3% accuracy, 1 second acquisition rate
3	Motion	Interrupt driven
4	Ambient Light Level	1 second acquisition rate 0-1024 Lux
5	Microphone	Analog audio and interrupt driven option, response <0.5 seconds
6	VOC	0-1187ppb, 60 second acquisition rate
7	eCO <sub>2</sub>	400-8192ppm, 60 second acquisition rate, (an equivalent eCO <sub>2</sub> measurement based on total VOC concentrations)

Absolute Maximum Ratings	Symbol	Min	Max	Unit
Storage Temperature	Tstg	-40	85	°C
Power Supply Input Voltage	Vdd	3.1	3.5	VDC
Total System Current Draw	Id	x	10*	mA*

\*w/ VOC/eCO<sub>2</sub> with value 33mA

Electrical Characteristics	Min	Max	Unit
Analog Audio Output Sensitivity	-25	-19	dBV
Analog Audio Output Freq Range	100	10k	Hz

Environmental Characteristics	Min	Max	Unit
Operating Temperature	-5	50	°C
Relative Humidity Operating, Non-Condensing Environment	5	95	%

### Electrical

- 3.3VDC input
- I<sup>2</sup>C Output (max. 100 kBaud)
- Interrupt driven event pin for motion detection
- Design optimized for maximum battery life

### Design Considerations

- Mounting location: ceiling, wall, corner
- PIR requires use of Fresnel lens
- Enclosure must allow free air movement over sensors
- Use of light pipe recommended to avoid shadowing

For enhanced motion detection, please contact TE.

Note: Refer to Application Spec 114-133092 or contact TE for additional design considerations when integrating with a host product.

### Pin Assignment

#### I<sup>2</sup>C Signals

Pin	Signal	I/O	Description
1	GND	I/O	Common Connection
2	Event Out	O	Motion detection
3	SCL	O	Clock Signal for I <sup>2</sup> C bus
4	SDA	O	Data signal for I <sup>2</sup> C bus
5	Vdd	I	3.3VDC Input

#### Audio Signals

Pin	Signal	I/O	Description
1	Audio Output	O	Analog audio output signal
2	GND	O	Common connection

**Product Selection Information**

Part Number	AmbiMate Series	Four Core	VOC	eCO <sub>2</sub>	Sound	HOST PRODUCT ATTACH METHOD**		
						Castellation	Vertical w/Header*	Plated Thru Hole
<a href="#">2316851-1</a>	MS4	•				•		
<a href="#">2316851-2</a>	MS4	•			•	•		
<a href="#">2316852-1</a>	MS4	•	•	•		•		
<a href="#">2316852-2</a>	MS4	•	•	•	•	•		
<a href="#">2314277-1</a>	MS4	•					•	
<a href="#">2314277-2</a>	MS4	•			•		•	
<a href="#">2314291-1</a>	MS4	•	•	•			•	
<a href="#">2314291-2</a>	MS4	•	•	•	•		•	
<a href="#">1-2314277-1</a>	MS4	•						•
<a href="#">1-2314277-2</a>	MS4	•			•			•
<a href="#">1-2314291-1</a>	MS4	•	•	•				•
<a href="#">1-2314291-2</a>	MS4	•	•	•	•			•

**Four Core Sense Capability**

- Motion (PIR)
- Light
- Temperature
- Humidity

**Optional Sense Capability**

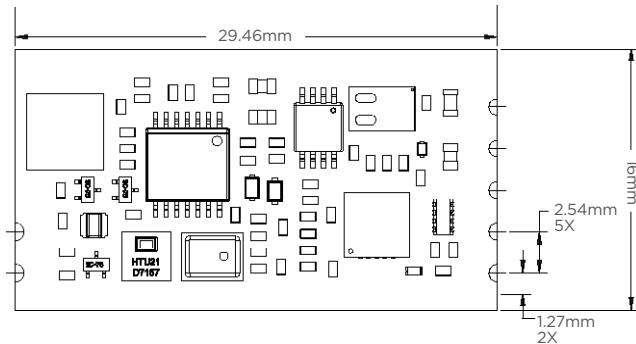
- VOC
- eCO<sub>2</sub>
- Sound (microphone)

\*.100" unshrouded high temp header for direct solder attach to .062" host PCB.

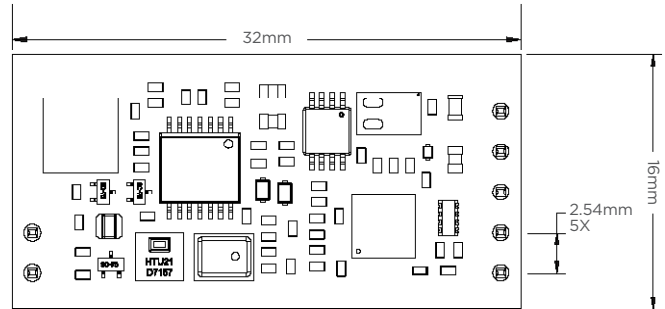
\*\*Other host product attach methods available (i.e. two piece separable or wire attach). Contact TE Sales or Product Management for options.

**Dimensions**

MS4 Series  
Castellation



MS4 Series  
Header and Plated Thru Hole



te.com

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